((AHS

South Coast
AIR QUALITY MANAGEMENT DISTRICT

HEADQUARTERS. 9150 E. FLAIR DR., EL MONTE, CA 91731

SOURCE TEST REPORT

C-82-216 &
C-82-236 - 240

CONDUCTED AT

BKK Landfill
Azusa, CA.

SURVEY FOR CHLORINATED COMPOUND
EMISSION LEAKAGE AT BKK LANDFILL

TESTED: September 27, thru October 8, 1982

ISSUED: Nov 5, 1982

Robert Hilovsky
Senior Air Quality Engineer

REVIEWED:

R. N. Hilovsky for

Robert N. Milner, Supervisor Air Quality Engineer

William B. K
Source Testing and Monito

EDWARD CAMARENA
DIRECTOR, ENFORCEMENT DIVISION

The California Air Resources Board (ARB), conducted a two week study from September 27 through October 8, 1982 at the BKK Landfill, located in West Covina. The District assisted ARB by providing laboratory for analysis of samples that could not be handled by ARB's lab analysis support and also took duplicate grab samples. The objective of the study was to determine the quality and quantity of any chlorinated compounds leaking from the landfill. The ARB also collected some off-site samples. (See Table I for compounds that will be analyzed from the grab samples.) Although the test samples can be analyzed for their constituents through proven, analytical methods, there is no confirmed or acceptable method available to determine the quanity of the leakage at the landfill. A number of techniques were used to try to measure the quanity of leakage. Values obtained from this localized leakage testing could not be used with any accuracy to determine total emissions from the landfill area.

Portable organic vapor analyzers (OVA) were used by ARB and the District to survey the landfill area to locate areas of leakage. The ARB's OVA was calibrated by vinyl chloride to measure the chlorinated chain of hydrocarbons but will respond to all organics. The District's OVA was calibrated with methane. Readings between the two OVA's did not vary more than 15 percent.

The OVA probes were passed over the landfill area very close to the ground surface (less than one inch) in searching for "hot spots" or leaks. In addition, flanges and fittings connecting the underground wells to the gas gathering flare system were surveyed for leaks. (Pictures 1 & 2) September 27 and 28 were used in the search for leak locations where grab samples could be taken. The test samples taken and their locations and comments of the days are listed in chronological order:

Test C82-216

September 27 - All readings and values presented were taken from the portable OVA or TLV meter with the probe within one inch of the surface measured at or at three to five feet above the ground for an "ambient" reading. The location and values obtained were:

Location	Reading (OVA) Total Organics
Diesel station	10 ppm (ambient)
Flare area	100 ppm (ambient)
Flame arrestor #1 flange	4800 ppm (one bolt)
Line C Well 38 area	15 ppm
Well 37 area	15 ppm
Line D Well 31 area	10 ppm
Well 30 area	300 ppm
Line G Well 51 area	0-2 ppm

Location	Reading (OVA) Total Organics
Well 50 area	10 ppm
Well 49 area	2 ppm
Line E Well 17 area	10 ppm (TLV)
B Well 14 area	8 ppm (TLV)
Test Station 13 area	10 ppm (TLV)

September 28 - Same test methods/techniques as September 27.

Location	Reading (OVA) Total Organics
Line C Well 37	10 ppm
Well 38	10 ppm
Well 39	7 ppm
Line D Well 31	30 ppm
Well 30	10,000 ppm
	10 ppm (5 ft. from leak)
Line J Well 84	>10,000 ppm
Line G Well 51	200 ppm (5 ft. from leak)
Line G Well 51	70 ppm
Well 49	>10,000 ppm (1 inch crack)
Well 49	30 ppm
Test Probe 13A	1-10,000 ppm (1 inch crack)
Well 13	10 ppm

Note: Upper limit of OVA is 10,000 ppm.

Test C82-236

September 29 - The OVA was used to locate specific leaks in the areas determined from previous days testing and grab samples were taken for laboratory analysis. ARB collected the grab samples in a Tedlar bag by pumping the bag full with a glass syringe. Each bag was then inserted into a dark

colored large size plastic trash liner to prevent deterioration of the sample from sunlight.

The District collected samples in Tedlar bags by pumping via a battery operated pump and then transferring the contents of the bag into two liter glass flasks. It should be noted that high concentration samples may leave a residue in a bag whereas the glass flasks can be washed in a solution to remove all traces of the sample. Due to laboratory work load, the District samples were analyzed for vinyl chloride only. The grab samples taken were:

Location	OVA Reading (Total Organics)	Laboratory Analysis Vinyl chloride
#2 Flame arrestor flange (One bolt of twenty showed leakage)	>10,000 - ppm	4.8 ppm
Rubber boot at fan (4 inch length around circumference) (Picture 3)	>10,000 ppm	3.0 ppm
Well 30 (Inside 3' diameter well shat no leakage outside of well shift)	250-700 ppm	0.4 ppm
Well 31 Transfer Pipe (1 inch of lip of earth cover)	>10,000 ppm	72 ppm
Well 84 Underground test probe (No leakage in surface area. Measurement of underground gases.	>10,000 ppm	810 ppm
Well 50 (1 inch length)	3,000 ppm	No sample taken
Test Probe 13A (1 inch length)	10,000 ppm	No sample taken

Ambient (2 inch above surface to 6 feet) 20 to 50 ppm

After ARB collected their grab sample, the District could not get a reading on the OVA at the location.

Note: Where leakage values occurred with high readings on the OVA, readings 1 to 2 inches from these spots dropped to that of the surrounding area indicating an insignificant flowrate from the leakage spots.

Test C82-237

September 30 - Sampling methods were the same as described for September 29th. Results were:

Location	OVA Reading (Total Organics)	Laboratory Analysis Vinyl chloride
Flare inlet-gas gathering line		720 ppm
#2 Flame arrestor (bolt)	900 ppm	No sample
#2 Flame arrestor (bolt)	4000 ppm	No sample
#4 Flame arrestor (bolt)	7000 ppm	No sample
Well 30 (trench area)	500 ppm	No sample
(around well casing)	2000 ppm	0.005 ppm
Ambient	10-30 ppm	

October 4 - The District did not take any grab samples on this day. ARB collected bag samples at lines G, E, E, G & B combined, AD & C combined. OVA readings of 5000 ppm were observed at ground level at an area about 10 ft. from both wells 30 and 31. Also, at ground level at Well 84, OVA readings of 5000 -10,000 ppm were observed. Ambient readings, 3 ft. from surface were 30 ppm indicating low volume flowrate from leak areas. It should be noticed that ARB did not purge their sampling bag nor sampling line prior to collecting samples. The bags could contain residual gases which could increase or decrease the apparent concentration of vinyl chloride in the sample collected.

Test C82-238

October 5 - Ambient sampling stations were located upwind and downwind of Well 84 (picture 4). Leaks in the flare area were enclosed with plastic bags and putty in an attempt to measure the quantity of the leak along with the concentration. Grab samples were collected from:

Location	OVA Reading (Total Organics)	Laboratory Analysis Vinyl chloride
Invert Can Well 84		160 ppm
Line H sample port (collected gases)		3.6 ppm
Line sample port (collected gases)		120 ppm
Ambient (Well 31)	10 ppm 100 ppm at ground level	

Inverted buckets were set up below (#1) and above (#2) line J to collect sample of emissions through the soil surface over an extented time period. Also, a grid pattern was marked around Well 30 and Well 84 in which concentrations could be measured hourly throughout a 24 hour time period to determine if there is a fluctuation of emissions throughout the day. Inverted bucket #3 was located above and near Well 30. (Picture 6 shows a bucket while extracting a sample.) Bucket #2 was was moved from the original location after low (OVA) readings were obtained when the buckets were checked later in the day. Well 84 was isolated from the collection system to determine what pressure/flowrate was being generated. The flowrate was measured by a flowmeter and found to be 1.4 liters/min.

Test C82-239

October 6 - The grid pattern layout around Wells 30 and 84 continued to be monitored by OVA method. The concentrations at Well 84 dropped significantly at 9:00 a.m. This could be due to a slight breeze from the westerly direction. The concentrations have not changed in any repeatable manner. This could be due to the nature of the loosely packed backfill and that the soil was disturbed within the grid area by footsteps of personnel sampling the inner part of grid (see picture 5).

Grab samples were taken from inverted buckets installed the previous day. The samples were pumped into a Tedlar bag and transferred to 2 liter flasks to be analyzed by the laboratory. The results were:

Location	OVA Reading (Total Organics)	Laboratory Analysis Vinyl chloride
Bucket 1 (Below Line J)	>10,000 ppm	61 ppm
Bucket 2 (Above Line J)	7,000 ppm	0.7 ppm
Bucket 3 (Well 30)	400 ppm	0.3 ppm
Bucket 4 (Well 31)	>10,000 ppm	10 ppm
Ambient (Well 30)	20-100 ppm	

Test C82-240

October 7 - Velocity traverses of the inlet and outlet to the flares (4 each) were taken using standard velocity traverse methods. A series of grab samples were taken from each flare exhaust for vinyl chloride analysis. In addition, hydrocarbon emissions were measured via the District TCA method. (Picture 7) Results of the laboratory analysis of the vinyl chloride emissions are shown below, however, the hydrocarbon analyses are not completed at this time and will be reported in a separate report.

Location	Vinyl Chloride
Blower inlet	970 ppm
#1 flare exhaust	1.0 ppm
#2 flare exhaust	0.20 ppm
#3 flare exhaust	0.44 ppm
#4 flare exhaust	0.021 ppm

Eff. of flares = 99.8%

October 8 - Testing via the use of the inverted bucket method was continued on the slope area above and below Line J - Well 84 (picture 8, figure I). Samples from the buckets were analyzed by the OVA. Results were:

Above Line J - PPM Total Organics

Time (AM)	Position:	A	B	C	D
9:00	PPM:	200	10,000	95	200
9:15		1,000	3,000	1,500	240
9:30		10,000	5,000	1,500	400
9:45		>10,000	6,000	1,800	300
9:55		>10,000	6,000	1,900	350
10:10		>10,000	5,500	1,400	400

Below Line J - PPM Total Organics

Time (AM)	Position:	A	B	C	D
10:30	PPM:	2	1.5	1.5	1
10:45		2	1.5	1.5	1.5
11:00		2	1.5	1.5	1.5
11:30		4	1.5	1.5	1

Grab sample results collected by ARB have been received and are included along with the District results in summary Table II.

Table II

Summary of vinyl chloride concentrations (ppm) at BKK Landfill facility at various locations.

	Location	SCAQMD	ARB
	Boot @ Fan	3.0	1.0
	Flame arrestor #2	4.8	2.0
	Well 30	0.4	0.6
	Well 84 (underground)	810	500
	Well 31 (transfer pipe)	72	40
	Well 50	No sample	0.2
September 30			
	Burner Inlet	720	500
	Well 30	0.005	
October 4			
	Line G	No sample	700
	Line E	No sample	500
	Line B	No sample	800
	Line F	No sample	20
	Line ACD	No sample	0.008
October 5			
	Line H	3.6	2
	Inverted can, Well 84 (1 hr.)	160	300
	Line J	120	200
	Well 84 (isolated from collection system)	No sample	80

Boot @ Fan	3.0	1.0
Ambient (100 yd. NE above Well 84) (8-11 AM)	No sample	0.01
Ambient (75 yd. SW below Well 84) (8-11 AM)	No sample	0.03
Ambient (below Well 84) (6:30-9:30 PM)	No sample	12.0

October 6

Ambient (Downslope Well 84) (8-10 AM)	No sample	0.02
Ambient (Upslope Well 84) (8-10 AM)	No sample	0.02
Bucket 1 Below Line J) (26 hr.)	61.0	10.0
Bucket 2 (Above Line J) (25 hr.)	0.7	0.5
Bucket 3 (Well 30) (26 hr.)	0.3	0.006
Bucket (Well 31) (24 hr.)	10.0	6.0
Bucket 5 (50' SE Well 31) (Drawn at 1 liter 1 hr. for 2 hrs.)	No sample	0.8

October 7

Blower inlet	970	700
#1 Flare Exhaust	1.0	0.7
#2 Flare Exhaust	0.2	0.3
#3 Flare Exhaust	0.44	0.1
#4 Flare Exhaust	0.02	0.02

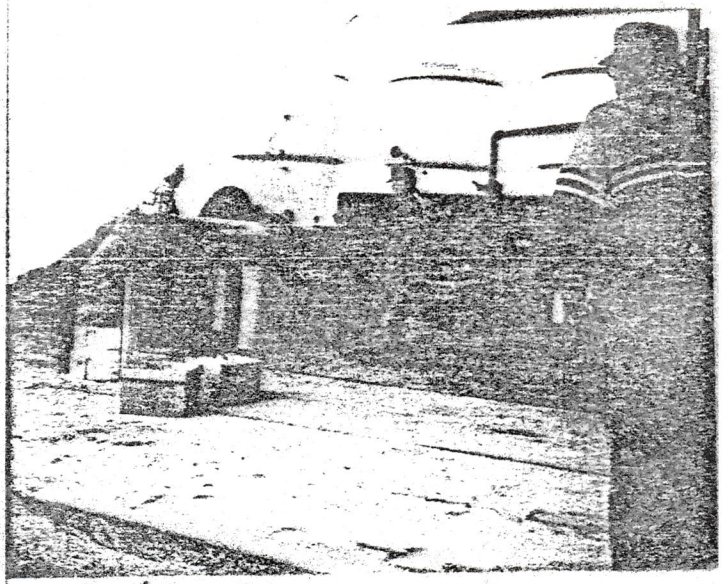
Table I

Evaluate samples for:

Vinyl chloride	V1
Chloromethane	H1
Bromomethane	B1
Freon 12	F1
Dichloromethane	H2
Freon 11	F2
1,1-Dichloroethene	H3
1,2,-Dichloroethene	H4
trans 1,2-Dichloroethene	H5
Trichloromethane	H6
1,2-Dichloroethane	H7
1,1,1-Trichloroethane	H8
Tetrachloromethane	H9
Bromodichloromethane	B2
1,2-Dichloropropane	B3
Trichloroethylene	B4
Chlorodibromomethane	B5
1,2-Dibromoethane	B6
Tribromomethane	B7
Tetrachloroethylene	B8
Benzene	B9

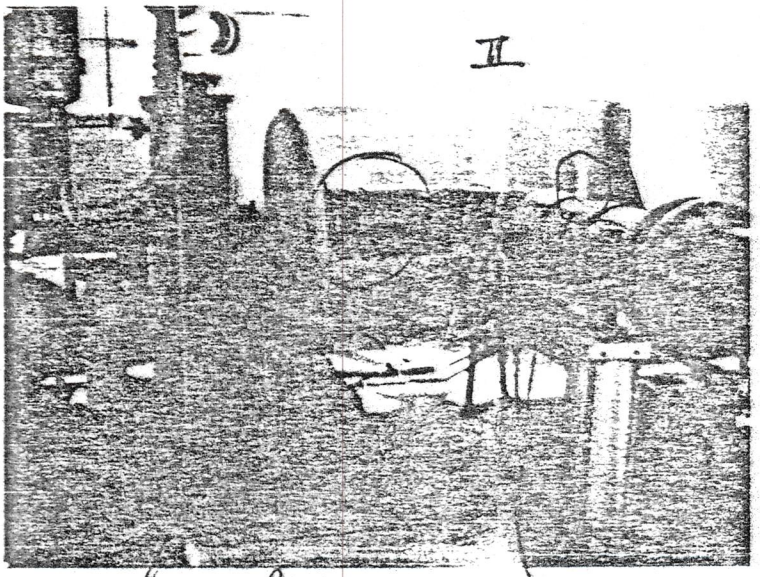
Picture I

OVA SURVEY AT GROUND LEVEL



Picture 2

MEASUREMENT OF LEAKS IN FLANGE AREA

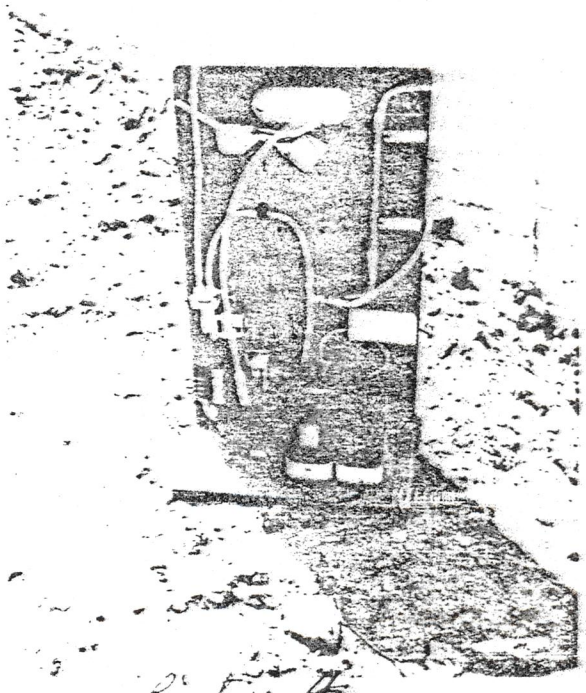


II

Picture 3

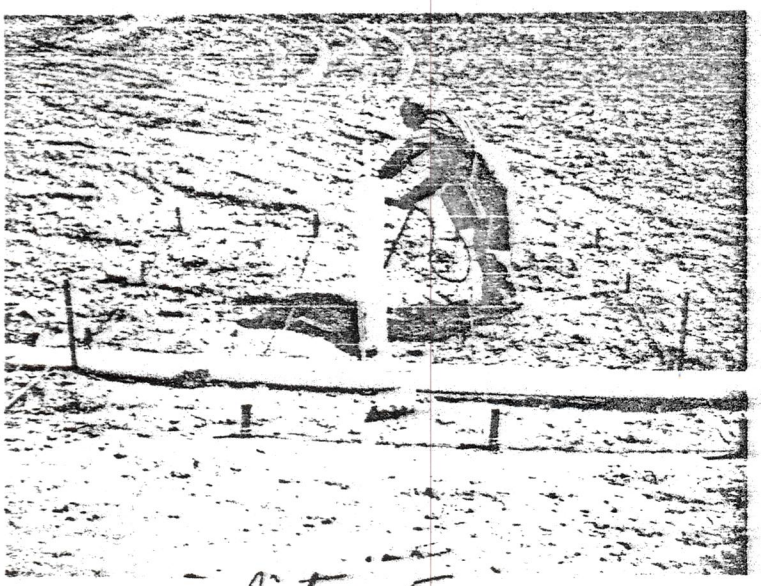
BOOT SECTIONS

INLET SAMPLE PORT



Picture 4

PUMP SYSTEM FOR AIR MONITORING (AMBIENT) STATION

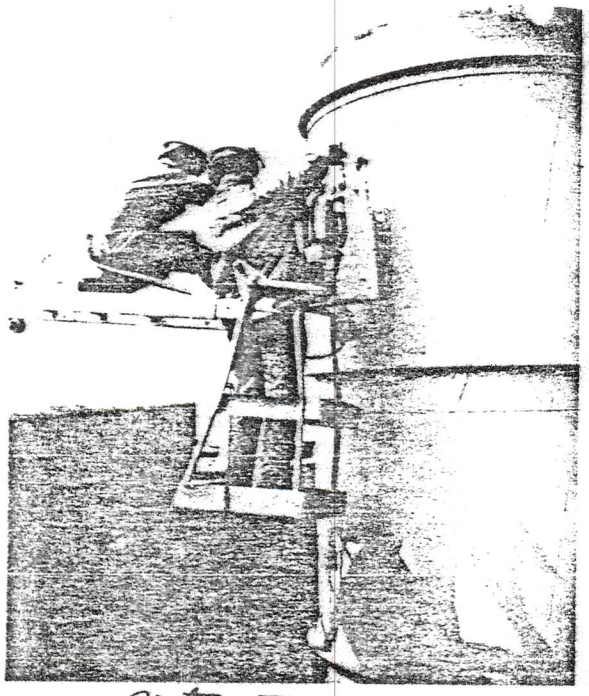


Picture 5

MEASUREMENT OF GRID SYSTEM

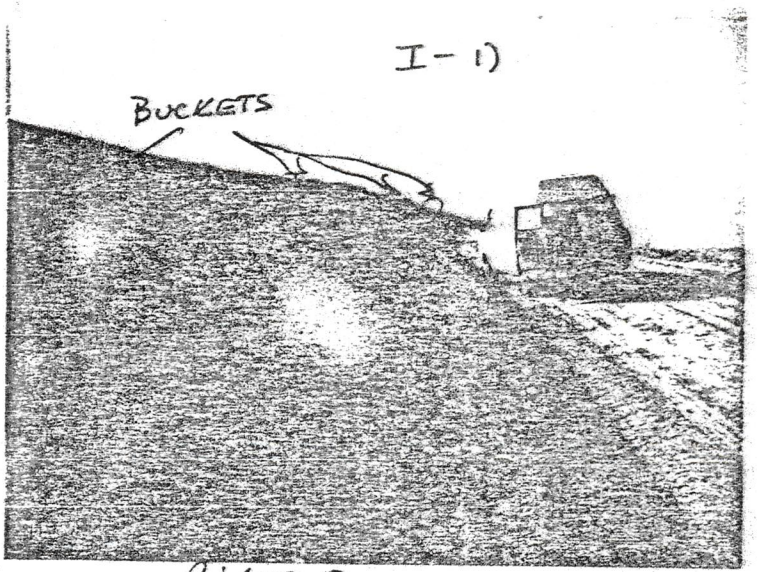
Picture 6

INVERTED BUCKET



Picture 7

SAMPLING HYDROCARBONS AT FLARE EXHAUST



Picture 8

BUCKET SETUP, SLOPE ABOVE LINE J.

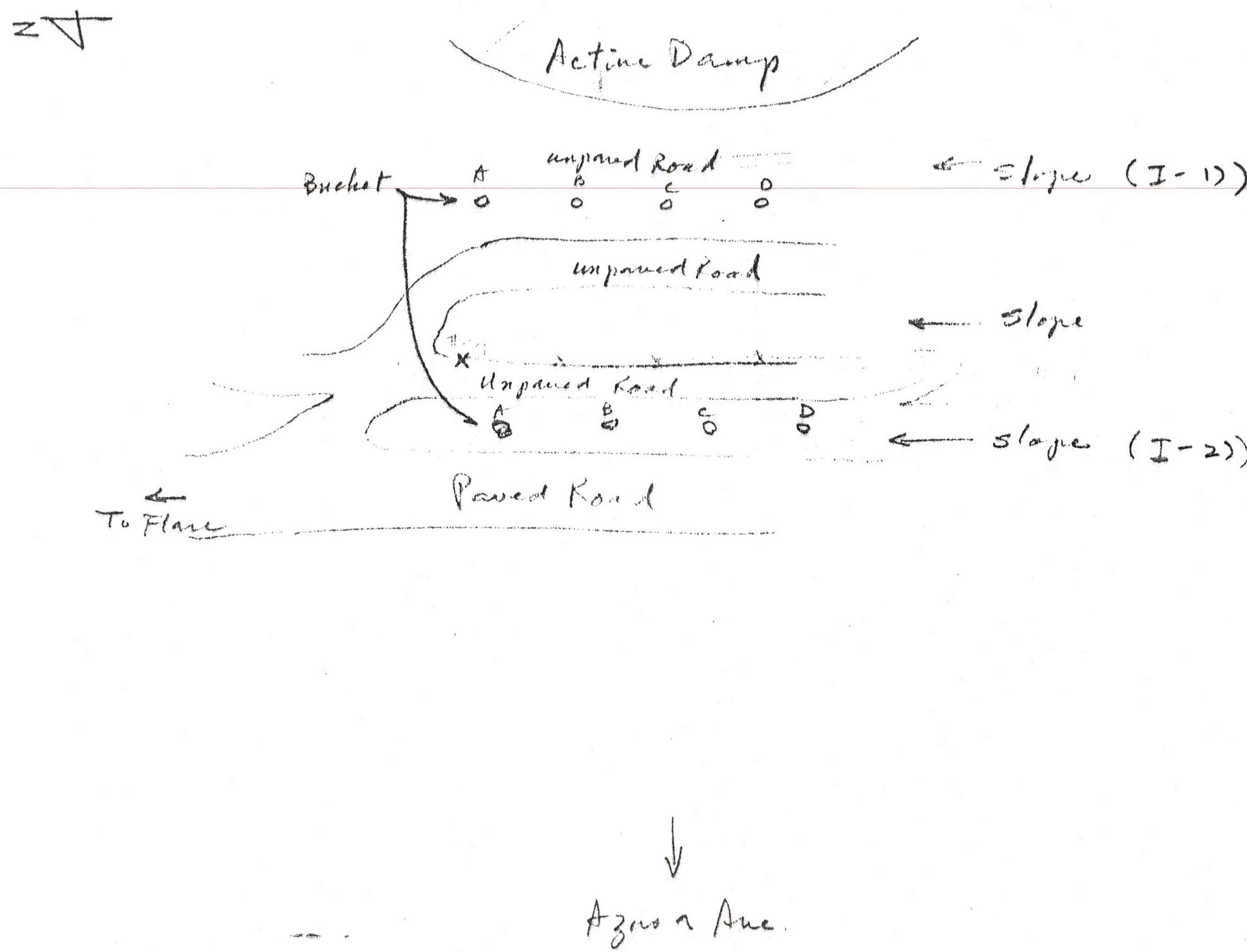

N
Active Damp
unpaved Road
Bucket
A
B
C
D
Slope (I-1)
unpaved Road
Slope
Unpaved Road
Slope (I-2)
Paved Road
To Flare
Azusa Ave.

FIGURE 7

PRELIMINARY

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BKK Landfill Sampling Program

Table 1

Gas Collection Lines

Gas samples were collected directly from seven vapor collection lines and a well that had not yet been connected to the gas collection system. The gas samples were all collected in a Tedlar bag via a 24 volt D.C. pump or a syringe. A special fitting to ensure a tight seal was used that was inserted as the cap to the test ports for the vapor collection lines and the wells.

Line Designation	Sampling Date	Vinyl Chloride (ppm)	Vinylidene Chloride (ppm)	Benzene (ppm)	1,2 Dichloro-ethane (ppm)	Trichloro-ethylene (ppm)	Perchloro-ethylene (ppm)
E	10-4	500	20	300	50	20	80
G	10-4	700	20	100	30	20	90
J	10-5	200	20	100	20	30	90
Well 84	9-29	500	60	100	100	40	80
Well 84*	10-5	80					
B	10-4	800	70	200	200	100	900
H	10-5	2	0.1	0.9	0.2	0.1	0.8
F	10-4	20	1	9	3	1	5
Burner manifold	9-30	500	40	200	80	30	50
Burner manifold	10-7	700	100	200	300	500	800

Sample analysis by Haagen-Smit Laboratory.

*After connection to Line J.

10/13/82

PRELIMINARY

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BKK Landfill Sampling Program

Table 2

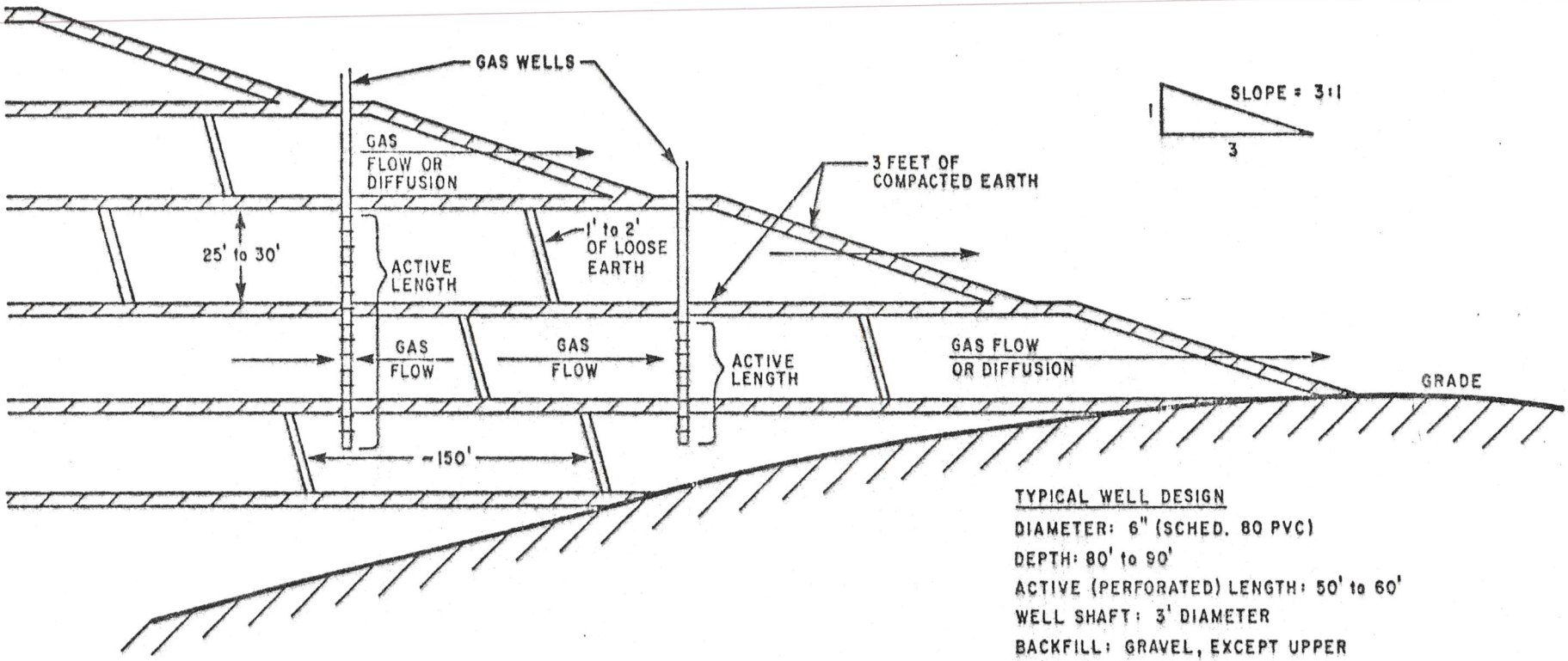
Gas Collection Rate

Gas flow rates for the individual collection lines were obtained from BKK. These were used with the gas analysis data to estimate collection rates for the individual components in each line.

Line Designation	Flow Rate (SCFM)	Vinyl Chloride (T/Y)	Vinylidene Chloride (T/Y)	Benzene (T/Y)	1,2 Dichloro-ethane (T/Y)	Trichloro-ethylene (T/Y)	Perchloro-ethylene (T/Y)
E	900	20	1.2	15	3.1	1.6	8.3
G	200	6	0.3	1.1	0.4	0.4	2.1
J	1700	15	2.3	9.2	2.3	4.6	18
B	1100	38	5.2	12	15	10	114
H	600	0.05	0.00	0.03	0.01	0.01	0.06
F	100	0.09	0.01	0.05	0.02	0.01	0.06
Burner manifold (9/30/82)	4429	96	12	48	24	12	25
Burner manifold (10/7/82)	4429	134	30	48	91	202	407

10/13/82

TYPICAL SECTION OF CELLS OF SOLID WASTE/LIQUID WASTE MIXES AT BKK LANDFILL



TYPICAL WELL DESIGN

DIAMETER: 6" (SCHED. 80 PVC)

DEPTH: 80' to 90'

ACTIVE (PERFORATED) LENGTH: 50' to 60'

WELL SHAFT: 3' DIAMETER

BACKFILL: GRAVEL, EXCEPT UPPER 30' DIRT-FILLED

TYPICAL SPACING ON COMMON COLLECTION LINE: 200'

COLLECTION LINE SPACING: VARIABLE

ARB/ENF - 10/82

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BKK Landfill Sampling Program

Table 3

Burner Source Test

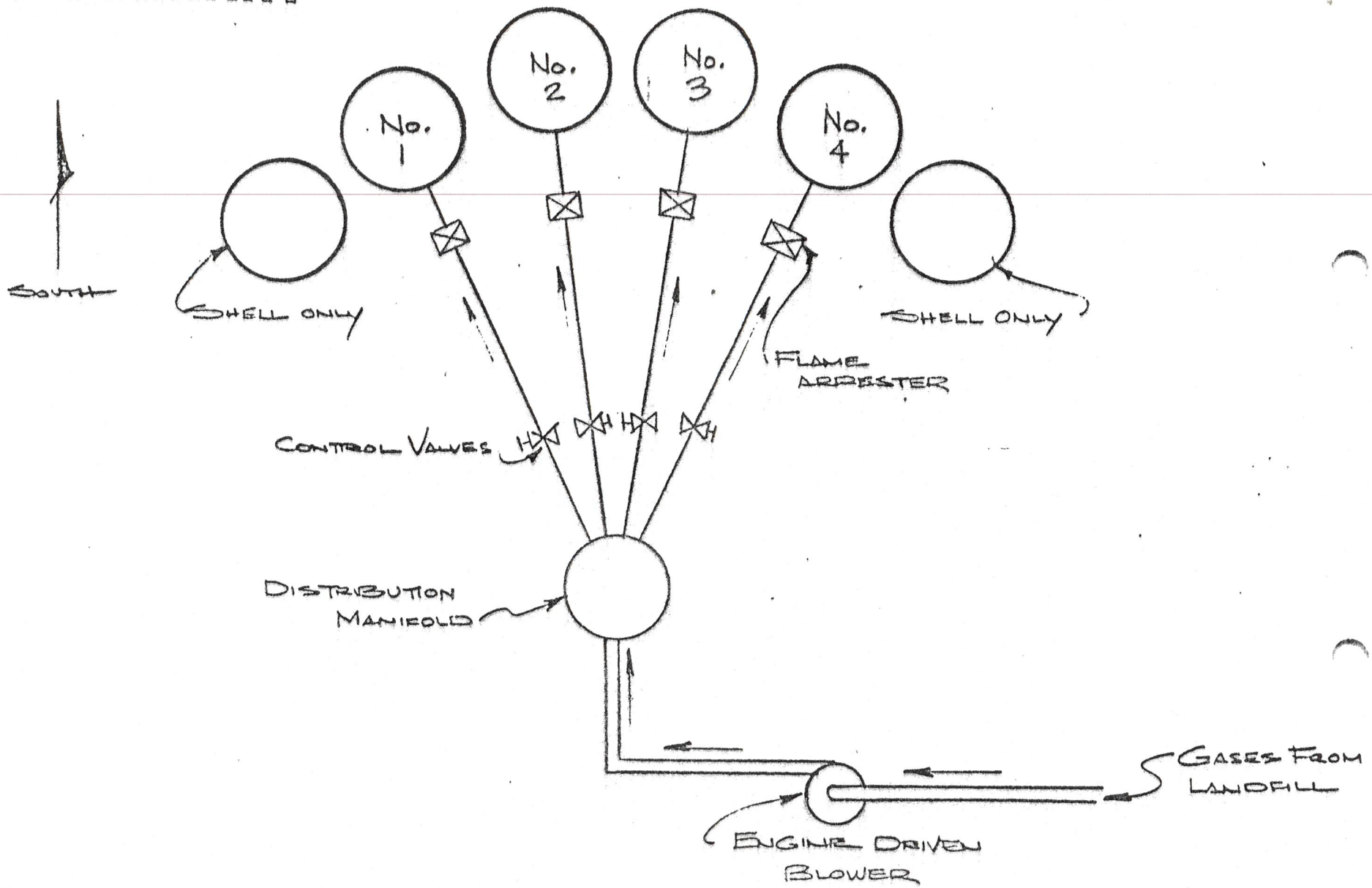
Four burners were operating during the source test period. Grab bag samples were taken from each of the four burners and a sample from the blower inlet line. A A stack velocity traverse was conducted on burner Nos. 1, 2. and 3. Fyrite samples for O_2 and CO_2 was taken from all the above sample points.

	Vinyl Chloride	Vinylidene Chloride	Benzene	1,2 Dichloro-ethane	Trichloro-ethylene	Perchloro-ethylene
Inlet Mass Rate (pounds/hour)	30.676	6.798	10.954	20.818	46.066	93.030
Outlet Mass Rate (pounds/hour)	0.087	0.005	0.010	0.012	0.016	0.054
Destruction Efficiency (percent)	99.7	99.9	99.9	99.9	100.0	99.9

10/13/82

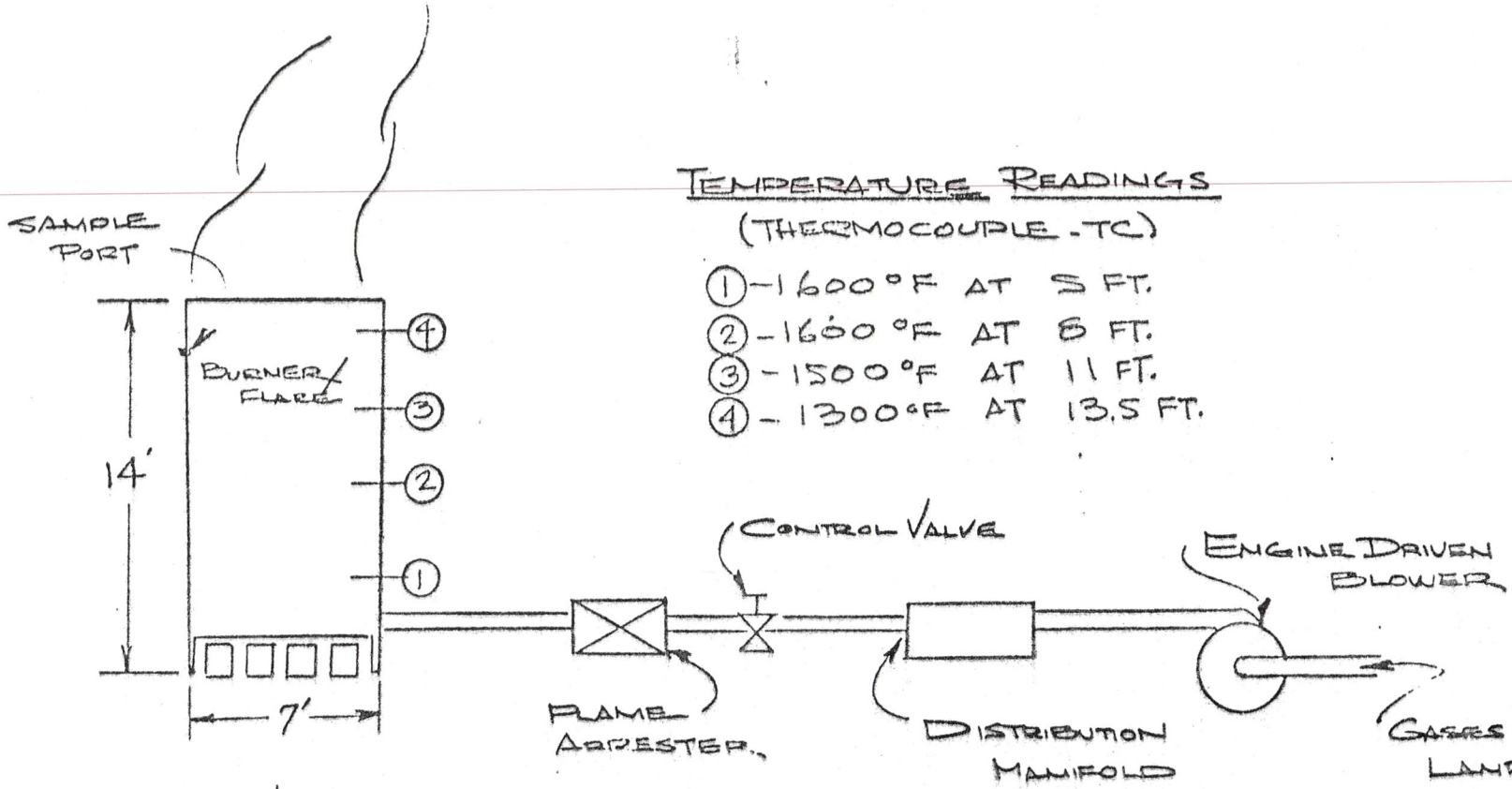
PRELIMINARY

TOP VIEW



BKK CORPORATION 2210 So. AZUSA AVE W. COVINA, CA	GAS FLOW FROM LANDFILL TO BURNER/FLARE	ARB/ENF. 10/82

PRELIMINARY



STACK EXIT VELOCITY
~14 fps

TEMPERATURE READINGS
(THERMOCOUPLE - TC)

① - 1600°F AT 5 FT.
② - 1600°F AT 8 FT.
③ - 1500°F AT 11 FT.
④ - 1300°F AT 13.5 FT.

SIDE VIEW

~ 1 sec residence time
should be fairly good system
Mogulef
10/13/82

BKK CORPORATION 2210 So. AZUSA AVE. W. COVINA, CA	No. 1 BURNER/FLARE TYPICAL INSTALLATION	ARB/ENF 10-82

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BKK Landfill Sampling Program

Table 4

Surface Emission Rate Measurements

Confined space indicators (CSI) with mouth areas of about one square foot were inverted on the ground at various locations for various periods of time. At the end of those periods, the total carbon under each CSI was measured with the organic vapor analyzer, and a nominal one liter of sample was withdrawn into a Tedlar bag for analysis by gas chromatograph (GC). Neglecting loss of the measured species through bulk flow out of the CSI (due to bulk flow from the ground), we estimated the rate of emission of species i(pounds/ft^2/hour) as:

$$E = Ci \times \frac{\text{CSI volume} + 1 \text{ liter}}{\text{CSI volume}} \times \frac{1}{\text{time}} \times \frac{1}{1 \text{ ft}^2}$$

where Ci = mass concentration in the bag

The second term reflects the assumptions that (1) clean air replaced the volume being withdrawn from the bucket into the bag and (2) the bag and CSI were well-mixed together at all times.

CSI Number	Location*	Emissions (pounds/acre/year) Vinyl Chloride	Vinylidene Chloride	Benzene	1,2 Dichloro-ethane	Trichloro-ethylene	Perchloro-ethylene
C1	3' from well 84	545	29	91	20	31	97
C2	150' S.E. of well 84	.69	.11	.026	.01	.030	.038
C3	100' S.E. of line J	.037	.006	.006	.005	.006	.038
C4	25' N.E. of well 31	.38	.069	.018	.046	.16	.20
C5	300' S.W. of well 31	0	.002	.002	.004	.007	.02
C6	50' S.E. of well 31	.73	.014	.34	.15	.76	1.7

*Sample area is 1 ft^2.

Sample analysis by Haagen-Smit Laboratory

Rich Bensen

10/13/82

PRELIMINARY

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Table 5

On-Site Ambient Monitors

Ambient air sampling stations were placed on-site upwind and downwind of suspected emission areas. Composite air samples were obtained to determine specific areas of high emissions. The ambient air samples were obtained in tedler bags via 24 volt D.C. pump. Location 1 sample height was 3 feet above ground; Location 2 was 2 feet above ground.

Monitor Location	Sampling Date & Time	Vinyl Chloride (ppm)	Vinylidene Chloride (ppm)	Benzene (ppm)	1,2 Dichloro-ethane (ppm)	Trichloro-ethylene (ppm)	Perchloro-ethylene (ppm)
1	10-5 0800-1100	.01	<.01	<.01	<.02	.04	.4
2	10-5 0800-1100	.03	<.01	.04	.2	.09	3
1	10-6 0800-1000	.02		.01			
2	10-6 0800-1000	.02		.01			

Sample analysis by Haagen-Smit Laboratory.

10/13/82

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BKK Landfill Sampling Program

Table 6

Vinyl chloride ambient air quality standard exceedances
June 1981 through September 1982.

Date	Number of Days Sampled	Number of Days Exceedances Recorded	Percent of Days Sampled that Exceedances Occurred
June 1981	26	15	57
July 1981	30	12	40
August 1981	28	13	46
September 1981	25	12	48
October 1981	29	11	38
November 1981	23	15	65
December 1981	30	15	50
January 1982	30	6	20
February 1982	18	4	22
March 1982	30	8	27
April 1982	30	7	23
May 1982	23	2	9
June 1982	21	4	19
July 1982	30	10	33
August 1982	31	7	23
September 1982	30	8	27
TOTAL	434	149	34

?

10/13/82

State of California

Memorandum

To : Don McNerny, Chief
Special Projects Section, E.D.

Date : September 28, 1982

Subject: Emission Estimate For BKK Landfill

From : Air Resources Board
Andrew J. Ranzieri, Manager
Air Quality Modeling Section

Andrew J. Ranzieri

As requested the Air Quality Modeling Section has performed a screening analysis to estimate the emission rate of vinyl chloride from the B.K.K. landfill in the SCAB.

The estimate is based on the following assumptions and data provided by Janette Munson of your staff:

1) Nocturnal emissions only contribute to the 24 hour average;

2) Emissions are emitted into cyclindical a volume 10m deep and 926m in diameter over a period of 8 hours;

3) Measured concentrations in ppm are converted to ug/m^3 using the equation of state and averaged for the five 24 hours periods at monitor A (The average concentration is 49. $4ug/m^3$); and

4) Emission rate is calculated using a simple box model assuming vinyl chloride to be inert.

Based on our analysis we estimate the emission rate of vinyl chloride to be about 1 kg/day.

It must be emphasized that this is an order of magnitude estimate which can be improved using site specific meteorological data. If you have any questions please do not hesitate to contact me or Kit Wagner of my staff.

cc: a/f,c/f,r/f

HAAGEN-SMIT LABORATORY
ATMOSPHERIC TESTING
TOXIC COMPOUNDS EN-10-S

9/29/1982 [illegible] DUMP BAS #201 BURNER AFT SIDE OF BOOT
Sample code # 9T2CWCNOJ

NO.	COMPOUND	PPM
1.	Vinyl chloride (Chloroethene)	1
2.	1,1-Dichloroethene (Vinylidene chloride)	NA *
3.	trans-1,2-Dichloroethene	NA *
4.	Trichloromethane (Chloroform)	NA *
5.	1,2-Dichloroethane (Ethylene chloride)	NA *
6.	Trichloroethylene (TCE)	NA *
7.	Tetrachloroethylene (PERC)	NA *
8.	Benzene	0.3

* NO ANALYSIS

HAAGEN-SMIT LABORATORY
ATMOSPHERIC TESTING
TOXIC COMPOUNDS EN-10-S.X

9/29/1982 BKK DUMP BAG #200 FEED LINE BURNER #2
Sample code # 9T2BWCN0I

NO.	COMPOUND	PPM
1.	Vinyl chloride (Chloroethene)	2
2.	1,1-Dichloroethene (Vinylidene chloride)	NA *
3.	trans-1,2-Dichloroethene	NA *
4.	Trichloromethane (Chloroform)	NA *
5.	1,2-Dichloroethane (Ethylene chloride)	NA *
6.	Trichloroethylene (TCE)	NA *
7.	Tetrachloroethylene (PERC)	NA *
8.	Benzen	NA *

* NO ANALYSIS

AAGEN-SMIT LABORATORY
ATMOSPHERIC TESTING
TOXIC COMPOUNDS EN-10-STX
9/29/1982 BKK DUMP BAG #303 WELL TEST POINT
Sample code # 9T2DWCNON

NO.	COMPOUND	PPM
1.	Vinyl chloride (Chloroethene)	0.6
2.	1,1-Dichloroethene (Vinylidene chloride)	NA *
3.	trans-1,2-Dichloroethene	NA *
4.	Trichloromethane (Chloroform)	NA *
5.	1,2-Dichloroethane (Ethylene chloride)	NA *
6.	Trichloroethylene (TCE)	NA *
7.	Tetrachloroethylene (PERC)	NA *
8.	Benzene	NA *

* NO ANALYSIS

HAAGEN-SMIT LABORATORY
ATMOSPHERIC TESTING
TOXIC COMPOUNDS EN-10-STX
9/29/1982 BKK DUMP BAG #302 HIGH CONC. WELL #84
Sample code # 9T2CWCNOM

Not connected to calculation system

NO.	COMPOUND	PPM
1.	Vinyl chloride (Chloroethene)	500
2.	1,1-Dichloroethene (Vinylidene chloride)	60
3.	trans-1,2-Dichloroethene	<10
4.	Trichloromethane (Chloroform)	0.60
5.	1,2-Dichloroethane (Ethylene chloride)	100
6.	Trichloroethylene (TCE)	40
7.	Tetrachloroethylene (PERC)	80
8.	Benzene	100

HAAGEN-SMIT LABORATORY
ATMOSPHERIC TESTING
TOXIC COMPOUNDS EN-10-5.X

9/29/1982 BKK DUMP BAG #301 B TO C LINE INTERCONNECT
Sample code # 9T2CWCNOL

NO.	COMPOUND	PPM
1.	Vinyl chloride (Chloroethene)	40
2.	1,1-Dichloroethene (Vinylidene chloride)	NA *
3.	trans-1,2-Dichloroethene	NA *
4.	Trichloromethane (Chloroform)	NA *
5.	1,2-Dichloroethane (Ethylene chloride)	NA *
6.	Trichloroethylene (TCE)	NA *
7.	Tetrachloroethylene (PERC)	NA *
8.	Benzene	NA *

* NO ANALYSIS

VAAGEN-SMIT LABORATORY
ATMOSPHERIC TESTING
TOXIC COMPOUNDS EN-10-STX
9/29/1982 BKK DUMP BAG #300 BKK WELLS
Sample code # 9T2CWCNOK

NO.	COMPOUND	PPM
1.	Vinyl chloride (Chloroethene)	0.2
2.	1,1-Dichloroethene (Vinylidene chloride)	NA *
3.	trans-1,2-Dichloroethene	NA *
4.	Trichloromethane (Chloroform)	NA *
5.	1,2-Dichloroethane (Ethylene chloride)	NA *
6.	Trichloroethylene (TCE)	NA *
7.	Tetrachloroethylene (PERC)	NA *
8.	Benzene	NA *

* NO ANALYSIS

HAAGEN-SMIT LABORATORY
ATMOSPHERIC TESTING
TOXIC COMPOUNDS EN-10-STX
9/30/1982 BK DUMP BAG #203 BURNER INLET HIGH CONC.
Sample code # 9U28WCN07

NO.	COMPOUND	PPM
1.	Vinyl chloride (Chloroethene)	500
2.	1,1-Dichloroethene (Vinylidene chloride)	40
3.	trans-1,2-Dichloroethene	<4
4.	Trichloromethane (Chloroform)	0.6
5.	1,2-Dichloroethane (Ethylene chloride)	80
6.	Trichloroethylene (TCE)	30
7.	Tetrachloroethylene (PERC)	50
8.	Benzene	200

HAAGEN-SMIT LABORATORY
ATMOSPHERIC TESTING
TOXIC COMPOUNDS EN-10-STX
10/4/1982 BKK DUMP BAG #1001 LINE G
Sample code # A42EWCN01

NO.	COMPOUND	PPM
1.	Vinyl chloride (Chloroethene)	700
2.	1,1-Dichloroethene (Vinylidene chloride)	20
3.	trans-1,2-Dichloroethene	<1
4.	Trichloromethane (Chloroform)	<0.01
5.	1,2-Dichloroethane (Ethylene chloride)	30
6.	Trichloroethylene (TCE)	20
7.	Tetrachloroethylene (PERC)	90
8.	Benzene	100

HAAGEN-SMIT LABORATORY
ATMOSPHERIC TESTING
TOXIC COMPOUNDS EN-10-STX
10/4/1982 BKK DUMP BAG #1002 LINE E
Sample code # A42EWCN02

NO.	COMPOUND	PPM
1.	Vinyl chloride (Chloroethene)	500
2.	1,1-Dichloroethene (Vinylidene chloride)	20
3.	trans-1,2-Dichloroethene	<4
4.	Trichloromethane (Chloroform)	0.6
5.	1,2-Dichloroethane (Ethylene chloride)	50
6.	Trichloroethylene (TCE)	20
7.	Tetrachloroethylene (PERC)	80
8.	Benzene	300

HAAGEN-SMIT LABORATORY
ATMOSPHERIC TESTING
TOXIC COMPOUNDS EN-10-STX
10/4/1982 BKK DUMP BAG #1003 LINE B
Sample code # A42EWCN03

NO.	COMPOUND	PPM
1.	Vinyl chloride (Chloroethene)	800
2.	1,1-Dichloroethene (Vinylidene chloride)	70
3.	trans-1,2-Dichloroethene	<10
4.	Trichloromethane (Chloroform)	<0.1
5.	1,2-Dichloroethane (Ethylene chloride)	200
6.	Trichloroethylene (TCE)	100
7.	Tetrachloroethylene (PERC)	900
8.	Benzene	200

HAAGEN-SMIT LABORATORY
ATMOSPHERIC TESTING
TOXIC COMPOUNDS EN-10-STX
10/4/1982 BKK DUMP BAG #1004 LINE F
Sample code # A42FWCN04

NO.	COMPOUND	PPM
1.	Vinyl chloride (Chloroethene)	20
2.	1,1-Dichloroethene (Vinylidene chloride)	1
3.	trans-1,2-Dichloroethene	<0.1
4.	Trichloromethane (Chloroform)	<0.001
5.	1,2-Dichloroethane (Ethylene chloride)	3
6.	Trichloroethylene (TCE)	1
7.	Tetrachloroethylene (PERC)	5
8.	Benzene	9

HAAGEN-SMIT LABORATORY
ATMOSPHERIC TESTING
TOXIC COMPOUNDS EN-10-STX
10/4/1982 BKK DUMP BAG #1005 LINES A C D
Sample code # A42FWCN05

NO.	COMPOUND	PPM
1.	Vinyl chloride (Chloroethene)	0.008
2.	1,1-Dichloroethene (Vinylidene chloride)	0.003
3.	trans-1,2-Dichloroethene	<0.002
4.	Trichloromethane (Chloroform)	<0.00002
5.	1,2-Dichloroethane (Ethylene chloride)	0.009
6.	Trichloroethylene (TCE)	0.006
7.	Tetrachloroethylene (PERC)	0.02
8.	Benzene	0.03

HAAGEN-SMIT LABORATORY
ATMOSPHERIC TESTING
TOXIC COMPOUNDS EN-10-STX
10/5/82 BKK DUMP BAG #1006 LINE H
Sample code # A52AWCN01

NO.	COMPOUND	PPM
1.	Vinyl chloride (Chloroethene)	2
2.	1,1-Dichloroethene (Vinylidene chloride)	0.1
3.	trans-1,2-Dichloroethene	<0.01
4.	Trichloromethane (Chloroform)	0.004
5.	1,2-Dichloroethane (Ethylene chloride)	0.2
6.	Trichloroethylene (TCE)	0.1
7.	Tetrachloroethylene (PERC)	0.8
8.	Benzene	0.9

HAAGEN-SMIT LABORATORY
ATMOSPHERIC TEST(G
TOXIC COMPOUNDS EN-.0-STX
10/5/1982 BKK DUMP BAG #1007
Sample code # A52AWCN02

NO.	COMPOUND	PPM
1.	Vinyl chloride (Chloroethene)	200
2.	1,1-Dichloroethene (Vinylidene chloride)	20
3.	trans-1,2-Dichloroethene	<1
4.	Trichloromethane (Chloroform)	2
5.	1,2-Dichloroethane (Ethylene chloride)	20
6.	Trichloroethylene (TCE)	30
7.	Tetrachloroethylene (PERC)	90
8.	Benzene	100

HAAGEN-SMIT LABORATORY
ATMOSPHERIC TESTING
TOXIC COMPOUNDS EN-10-STX
10/5/1982 BKK DUMP BAG #1008
Sample code # A52FWCN03

Well 84 underground gas not connected to system

NO.	COMPOUND	PPM
1.	Vinyl chloride (Chloroethene)	80
2.	1,1-Dichloroethene (Vinylidene chloride)	NA *
3.	trans-1,2-Dichloroethene	NA *
4.	Trichloromethane (Chloroform)	NA *
5.	1,2-Dichloroethane (Ethylene chloride)	NA *
6.	Trichloroethylene (TCE)	NA *
7.	Tetrachloroethylene (PERC)	NA *
8.	Benzene	80

* NO ANALYSIS

HAAGEN-SMIT LABORATORY
ATMOSPHERIC TESTING
TOXIC COMPOUNDS EN-10-STX
10/5/1982 BKK DUMP BAG #3001
Sample code # A529WCN09

Small leak
Bucket
3 ft east
well 84
1/2 liter

NO.	COMPOUND	PPM
1.	Vinyl chloride (Chloroethene)	300
2.	1,1-Dichloroethene (Vinylidene chloride)	10
3.	trans-1,2-Dichloroethene	7
4.	Trichloromethane (Chloroform)	0.5
5.	1,2-Dichloroethane (Ethylene chloride)	7
6.	Trichloroethylene (TCE)	8
7.	Tetrachloroethylene (PERC)	20
8.	Benzene	40

HAAGEN-SMIT LABORATORY
ATMOSPHERIC TESTING
TOXIC COMPOUNDS EN-10-STX
10/5/1982 BKK DUMP BAG #4002
Sample code # A528WCN35

75 cw downslope well 84. air monitor 8-11 AM

NO.	COMPOUND	PPM
1.	Vinyl chloride (Chloroethene)	0.03
2.	1,1-Dichloroethene (Vinylidene chloride)	<0.01
3.	trans-1,2-Dichloroethene	<0.1
4.	Trichloromethane (Chloroform)	<0.001
5.	1,2-Dichloroethane (Ethylene chloride)	0.2
6.	Trichloroethylene (TCE)	0.09
7.	Tetrachloroethylene (PERC)	3
8.	Benzene	0.04

HAAGEN-SMIT LABORATORY
ATMOSPHERIC TESTING
TOXIC COMPOUNDS EN-10-STX
10/5/1982 BKK DUMP BAG #4001
Sample code # A528WCN34

wpd NE above Well 84 air Monitor 3 hour 8:00 -11

NO.	COMPOUND	PPM
1.	Vinyl chloride (Chloroethene)	0.01
2.	1,1-Dichloroethene (Vinylidene chloride)	<0.01
3.	trans-1,2-Dichloroethene	<0.1
4.	Trichloromethane (Chloroform)	<0.001
5.	1,2-Dichloroethane (Ethylene chloride)	<0.02
6.	Trichloroethylene (TCE)	0.04
7.	Tetrachloroethylene (PERC)	0.4
8.	Benzene	<0.01

HAAGEN-SMIT LABORATORY
ATMOSPHERIC TESTING
TOXIC COMPOUNDS EN-10-STX
10/5/1982 BKK DUMP BAG #4003
Sample code # A52IWCN3A

Downtype. wlf 84
ambient
1830 to 2130 Lotus

NO.	COMPOUND	PPM
1.	Vinyl chloride (Chloroethene)	12
2.	1,1-Dichloroethene (Vinylidene chloride)	NA *
3.	trans-1,2-Dichloroethene	NA *
4.	Trichloromethane (Chloroform)	NA *
5.	1,2-Dichloroethane (Ethylene chloride)	NA *
6.	Trichloroethylene (TCE)	NA *
7.	Tetrachloroethylene (PERC)	NA *
8.	Benzene	0.01

* NO ANALYSIS

HAAGEN-SMIT LABORATOR
ATMOSPHERIC TESTING
TOXIC COMPOUNDS EN-10-STX
10/6/1982 BKK DUMP BAG #4006
Sample code # A628WCN29

Contract dump, 84
6-10

NO.	COMPOUND	PPM
1.	Vinyl chloride (Chloroethene)	0.02
2.	1,1-Dichloroethene (Vinylidene chloride)	<0.001
3.	trans-1,2-Dichloroethene	<0.01
4.	Trichloromethane (Chloroform)	<0.0001
5.	1,2-Dichloroethane (Ethylene chloride)	<0.002
6.	Trichloroethylene (TCE)	0.008
7.	Tetrachloroethylene (PERC)	0.05
8.	Benzene	0.01

* NO ANALYSIS

HAAGEN-SMIT LABORATORY
ATMOSPHERIC TESTING
TOXIC COMPOUNDS EN-10-STX
10/6/1982 BKK DUMP BAG #4005
Sample code # A628WCN28

ambient
upslope 84

8-10

NO.	COMPOUND	PPM
1.	Vinyl chloride (Chloroethene)	0.02
2.	1,1-Dichloroethene (Vinylidene chloride)	<0.001
3.	trans-1,2-Dichloroethene	<0.01
4.	Trichloromethane (Chloroform)	<0.0001
5.	1,2-Dichloroethane (Ethylene chloride)	<0.002
6.	Trichloroethylene (TCE)	0.004
7.	Tetrachloroethylene (PERC)	0.02
8.	Benzene	0.01

HAAGEN-SMIT LABORATORY
ATMOSPHERIC TESTING
OXIC COMPOUNDS EN-10-81X
10/6/1982 BKK DUMP BAG #3011
Sample code # A62EWCN04

Bucket
150' SE well 84
26 hr
OVA 10000ppm

NO.	COMPOUND	PPM
1.	Vinyl chloride (Chloroethene)	10
2.	1,1-Dichloroethene (Vinylidene chloride)	1
3.	trans-1,2-Dichloroethene	1
4.	Trichloromethane (Chloroform)	0.02
5.	1,2-Dichloroethane (Ethylene chloride)	0.1
6.	Trichloroethylene (TCE)	0.2
7.	Tetrachloroethylene (PERC)	0.2
8.	Benzene	0.3

HAAGEN-SMIT LABORATORY
ATMOSPHERIC TESTING
TOXIC COMPOUNDS EN-10-STX
10/6/1992 BKK DUMP BAG #3012
Sample code # A62FWCN05

show with 84
25 hr
CVA
7000 ppm

NO.	COMPOUND	PPM
1.	Vinyl chloride (Chloroethene)	0.5
2.	1,1-Dichloroethene (Vinylidene chloride)	0.06
3.	trans-1,2-Dichloroethene	<0.01
4.	Trichloromethane (Chloroform)	0.002
5.	1,2-Dichloroethane (Ethylene chloride)	0.04
6.	Trichloroethylene (TCE)	0.04
7.	Tetrachloroethylene (PERC)	0.2
8.	Benzene	0.07

HAAGEN-SMIT LABORATORY
ATMOSPHERIC TESTING
TOXIC COMPOUNDS EN-10-STX
10/6/1982 BKK DUMP BAG #3013
Sample code # A62GWCN06

Bunker Above well 31
25' NE
24 hr.

NO.	COMPOUND	PPM
6.	Vinyl chloride (Chloroethene)	6
7.	1,1-Dichloroethene (Vinylidene chloride)	0.6
8.	trans-1,2-Dichloroethene	1
4.	Trichloromethane (Chloroform)	0.0006
5.	1,2-Dichloroethane (Ethylene chloride)	0.4
6.	Trichloroethylene (TCE)	1
7.	Tetrachloroethylene (PERC)	1
8.	Benzene	0.9

NO ANALYSIS

HAAGEN-SMIT LABORATORY
ATMOSPHERIC TESTING
TOXIC COMPOUNDS EN-10-STX
10/6/1982 BKK DUMP BAG #3014
Sample code # A62FWCN07

100' SW Bucket
well 31
26 hr.
OVA 400 ppm

NO.	COMPOUND	PPM
1.	Vinyl chloride (Chloroethene)	0.006
2.	1,1-Dichloroethene (Vinylidene chloride)	0.02
3.	trans-1,2-Dichloroethene	<0.01
4.	Trichloromethane (Chloroform)	0.0002
5.	1,2-Dichloroethane (Ethylene chloride)	0.04
6.	Trichloroethylene (TCE)	0.05
7.	Tetrachloroethylene (PERC)	0.1
8.	Benzene	0.02

HAAGEN-SMIT LABORATORY
ATMOSPHERIC TESTING
TOXIC COMPOUNDS EN-10-STX
10/6/1982 BKK DUMP BAG #3010
Sample code # A62GWCN23

Bucket
50' SE
well 31
Drawn @ 1 lit/hr
for 2 hr

NO.	COMPOUND	PPM
1.	Vinyl chloride (Chloroethene)	0.8
2.	1,1-Dichloroethene (Vinylidene chloride)	0.1
3.	trans-1,2-Dichloroethene	0.5
4.	Trichloromethane (Chloroform)	0.005
5.	1,2-Dichloroethane (Ethylene chloride)	0.2
6.	Trichloroethylene (TCE)	0.4
7.	Tetrachloroethylene (PERC)	0.7
8.	Benzene	0.3

HAAGEN-SMIT LABORATORY
ATMOSPHERIC TESTING
TOXIC COMPOUNDS EN-10-S.X
10/7/1982 BKK DUMP BAG #005
Sample code # A72CWCN05

filet to Manifold

NO.	COMPOUND	PPM
1.	Vinyl chloride (Chloroethene)	700
2.	1,1-Dichloroethene (Vinylidene chloride)	100
3.	trans-1,2-Dichloroethene	<10
4.	Trichloromethane (Chloroform)	0.5
5.	1,2-Dichloroethane (Ethylene chloride)	300
6.	Trichloroethylene (TCE)	500
7.	Tetrachloroethylene (PERC)	800
8.	Benzene	200

-- NO ANALYSIS

HAAGEN-SMIT LABORATORY
ATMOSPHERIC TESTING
TOXIC COMPOUNDS EN-10-[illegible] X
10/7/1982 BKK DUMP BAG #002
Sample code # A729WCN02

#1 EXH

NO	COMPOUND	PPM
1.	Vinyl chloride (Chloroethene)	0.7
2.	1,1-Dichloroethene (Vinylidene chloride)	0.04
3.	trans-1,2-Dichloroethene	<0.01
4.	Trichloromethane (Chloroform)	<0.0001
5.	1,2-Dichloroethane (Ethylene chloride)	0.03
6.	Trichloroethylene (TCE)	0.04
7.	Tetrachloroethylene (PERC)	0.07
8.	Benzene	0.02

NO ANALYSIS

HAAGEN-SMIT LABORATORY
ATMOSPHERIC TESTING
TOXIC COMPOUNDS EN-10-SIX
10/7/1982 BKK DUMP BAG #001
Sample code # A729WCN01

#2 EX4

NO.	COMPOUND	PPM
1.	Vinyl chloride (Chloroethene)	0.3
2.	1,1-Dichloroethene (Vinylidene chloride)	<0.001
3.	trans-1,2-Dichloroethene	<0.01
4.	Trichloromethane (Chloroform)	<0.0001
5.	1,2-Dichloroethane (Methylene chloride)	0.05
6.	Trichloroethylene (TCE)	0.02
7.	Tetrachloroethylene (PERC)	0.1
8.	Benzene	0.03

* NO ANALYSIS

HAAGEN-SMIT LABORATORY
ATMOSPHERIC TESTING
TOXIC COMPOUNDS EN-10-5 X
10/7/1982 BKK DUMP B/3 #003 # 3 EXH
Sample code # A729WCN03

NO.	COMPOUND	PPM
1.	Vinyl chloride (Chloroethene)	0.1
2.	1,1-Dichloroethene (Vinylidene chloride)	<0.001
3.	trans-1,2-Dichloroethene	<0.01
4.	Trichloromethene (Chloroform)	<0.0001
5.	1,2-Dichloroethane (Ethylene chloride)	0.02
6.	Trichloroethylene (TCE)	0.02
7.	Tetrachloroethylene (PERC)	0.07
8.	Benzene	0.03

HAAGEN-SMIT LABORATORY
ATMOSPHERIC TESTING
TOXIC COMPOUNDS EN-10-S X
10/7/1982 BKK DUMP BAG #004
Sample code # A72AWCN04

#4 EXH

NO.	COMPOUND	PPM
1.	Vinyl chloride (Chloroethene)	0.02
2.	1,1-Dichloroethene (Vinylidene chloride)	<0.001
3.	trans-1,2-Dichloroethene	<0.01
4.	Trichloromethane (Chloroform)	<0.0001
5.	1,2-Dichloroethane (Ethylene chloride)	<0.002
6.	Trichloroethylene (TCE)	0.02
7.	Tetrachloroethylene (PERC)	0.03
8.	Benzene	0.02